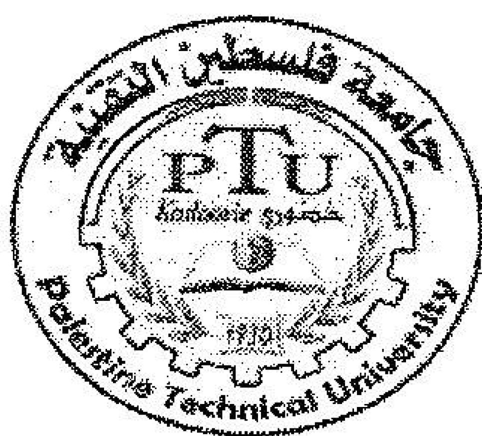
تم الرفع بواسطة
م. معن ابوعيسى

احتمالات ومتغيرات عشوائية - نهائي

Specialization:	Electrical Engineering		Palestinian National Authority Ministry Education & Higher Education Palestine Technical University College of Engineering & Technology
Course Name:	Probability and Random Variables for Engineers		
Date:	29/05/2011		
Time:	11:00-13:00		
Instructor:	Dr. Mutamed Khatib		Final Exam 2nd semester 2010/2011

1. *(5 marks)* The probability generating function for a random variable X is given by:
$$g_X(z)=\frac{z^{10}+z^{20}}{2}$$
Find $E(X^2+1)$

2. *(5 marks)* Suppose that X, Y and Z are independent random variables with $X\sim N(1,4)$, $Y\sim N(2,9)$ and $Z\sim N(3,16)$, Find $P(2X-Y+Z>5)$
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3. *(5 marks)* Suppose that the RV W has a moment generating function $M_X(t)=e^{-2t+4t^2}$, find $E(W)$.

4. *(5 marks)* The probability density function for (X,Y) is given by:
$$f_{X,Y}(x,y)=\begin{cases}1 & 0\le x\le 1, 0\le y\le 1\\ 0 & else\end{cases}$$
Find the cumulative distribution function for the random variable $Z=X+Y$

5. *(5 marks)* Let (X,Y) be a continuous random vector with joint probability density function given by:
$$f_{X,Y}(x,y)=\begin{cases}4xy & 0\le x\le 1, 0\le y\le 1\\ 0 & else\end{cases}$$
Find $P(X>0.5\,|\,Y\le 0.5)$

6. Let X be a random variable with probability density function:
$$f_X(x)=\begin{cases}\frac{2}{x^2} & 1\le x\le 2\\ 0 & else\end{cases}$$
Let F denote the cumulative distribution function of X.
   (a) *(5 marks)* Compute $F(-11)$
   (b) *(5 marks)* Find $E[X]$

7. *(5 marks)* Let X be a continuous random variable having the probability density function:
$$f_X(x)=\begin{cases}1.5(1-x^2) & 0\le x\le 1\\ 0 & else\end{cases}$$
Find $P(X\ge 0.5)$

Good luck